Data Requirements for Asset Management

Corps of Engineers
Asset Risk and Reliability Workshop

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Migrating from Data to Information to Knowledge-based Asset Management

- **What is the right data?**
  - **For existing Asset Portfolio?**
  - **For Acute Pending Failure or High Risk Assets?**
  - **For Routine O&M for Lowest Life Cycle Cost and Justified Asset Reliability?**

- **What are the data & information for knowledge development?**
  - **Asset Description and Condition**
  - **Functions and associated standards of performance of the asset in the defined operating context**
  - **Functional Failures and Causes (modes)**
  - **Failure Effects and Consequences**
  - **Asset Ranking System in terms of risk and reliability of asset to provide function for mission**
  - **Proactive Tasks with intervals or condition trigger points to predict or prevent failures with resources required**
  - **Default actions if there are no proactive tasks possible or are not performed with that resource burden**
  - **Performance and Benchmarking Data and Information**

Forms of Data

- Text or numerical data
- Drawings, graphics or photos
- Digital data
  - Batch loaded
  - Real Time from monitors or control systems
- Status data
  - State or condition of an element, component or asset
  - Event: failure, unsat performance, rebuild/replace, extreme out of tolerance operation or duty cycle etc
- Software programs

Embedded or linked to application database

Data Management Considerations

- **For Gathering Data** (consider burden, data use and consistency for life cycle of asset)
  - **During scoping, planning, designing and constructing assets**
  - **During O&M**
  - **During Forensic Analysis of Failures**
  - **During Asset Condition Assessment**
  - **During Resource Allocation Analysis**
  - **During Rehab or Replace Analysis**
- **For Retention of Data**
  - **Consider security, access, volume, technical evolution and methods**
- **For Retrieval of Data**
  - **Consider frequency, volume, applicability/maturity, transportability and security of data**

Asset Management Data Consistency Issues

- **Asset Hierarchy Structure and Levels**
  - **Must follow industrial system logic**
    - **System: Provides Function w/ Measurable Performance**
      - **Subsystem: Supports system and provides defined supportive function**
        - » **Component: Segment of subsystem maintained or replaced**
- **Depth of Asset Hierarchy**
  - **Correlated to criticality of asset and failure modes**
    - **If tracking failure of subcomponents, hierarchy must be to that depth**
- **Asset Classes Established within and across Business Lines and Common Infrastructure**

Current AISs and Fundamental Focus of Each

- **FEM**
- **OMBIL**
- **REMIS**
- **APPMIS**
- **P2**
- **CEFMS**
- **O&M Work Management**
- **Products and Performance Metrics**
- **Real Property Asset Accountability and Inventory**
- **Personal Property Asset Accountability and Inventory**
- **project Management**
- **Fiscal Management**

REMIS, OMBIL and FEM Relationships, Navigation Example

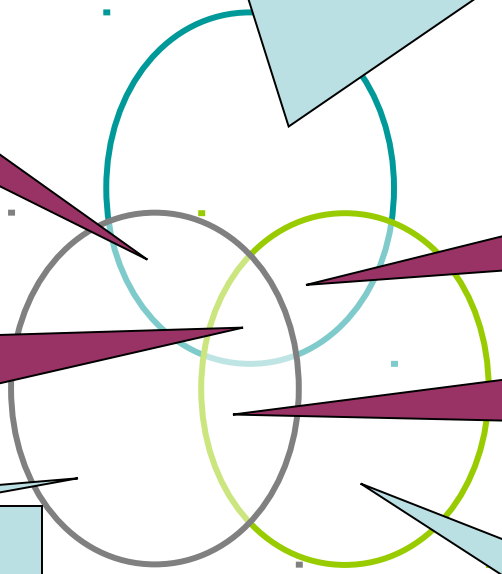
OMBIL: Business Information
with Output of Performance Metrics
with Inputs of
Products, Availability and Utilization from LPMS
CAL costs from CEFMS, Production Level O&M asset costs from FEM

OMBIL to FEM Asset Alignment Level: Product Provider such as Chamber 1

OMBIL to REMIS Asset Alignment Level: ??

OMBIL-FEM-REMIS Asset Alignment Level: Constructed Asset Level (CAL)

REMIS to FEM Asset Alignment Level: Retirement Unit



FEM: Asset O&M Work Manager
with Outputs of
Equipment Condition Assessment Data
O&M Costs for assets below constructed asset level
with Inputs of
Business Line level O,M and non routine funding from CEFMS

REMIS: Asset Inventory of Record
with Output of E.O. 13327 data elements
with Inputs of
Retirement Unit O&M costs from FEM

Current Asset Condition Assessment Tools

- **HydroAMP**
- **BUILDER**
- **Gate and Valve, Lockwall, Operating Equip CIs**
- **Embankment, Spillway, Tainter Gate, Concrete Dam Monolith CIs**
- **RecBEST comparative condition rating**
- **ERGO/EMS/HEP elements**

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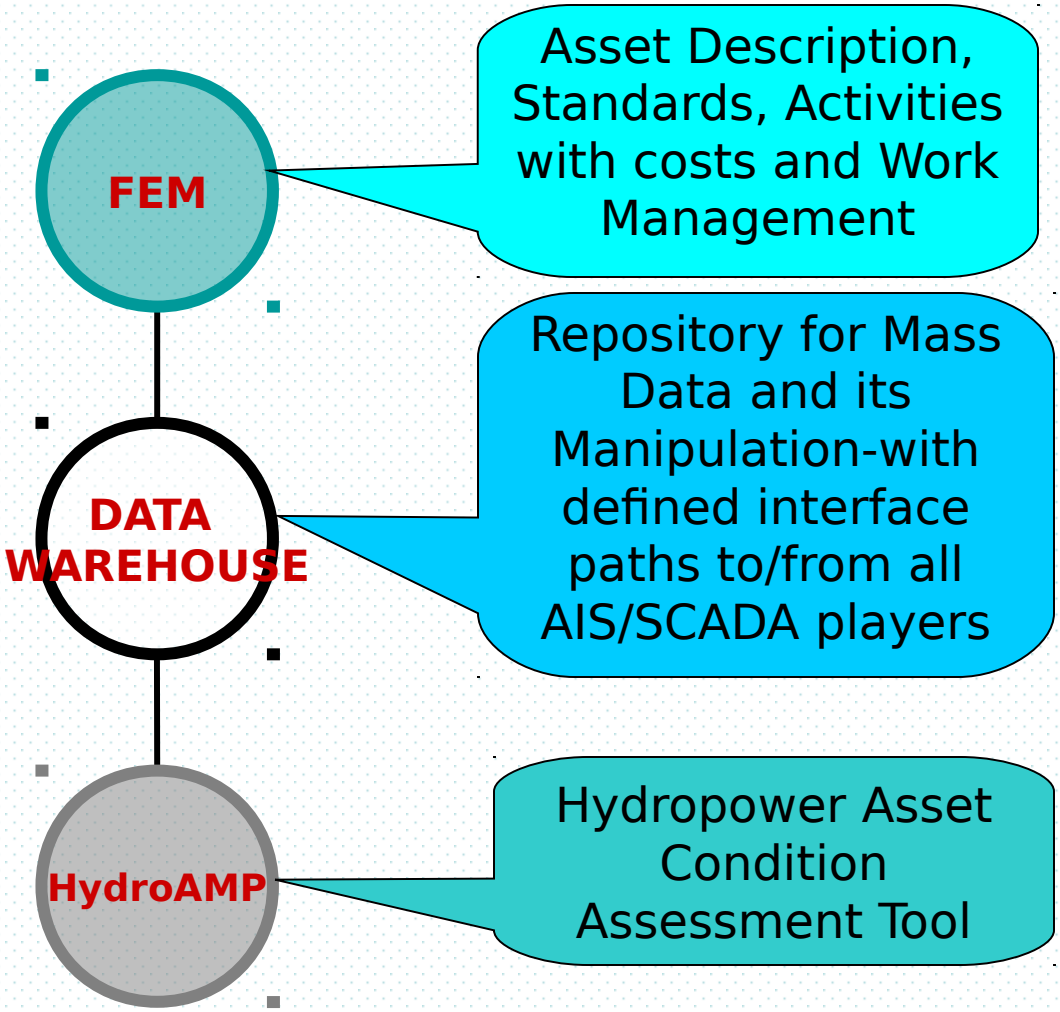
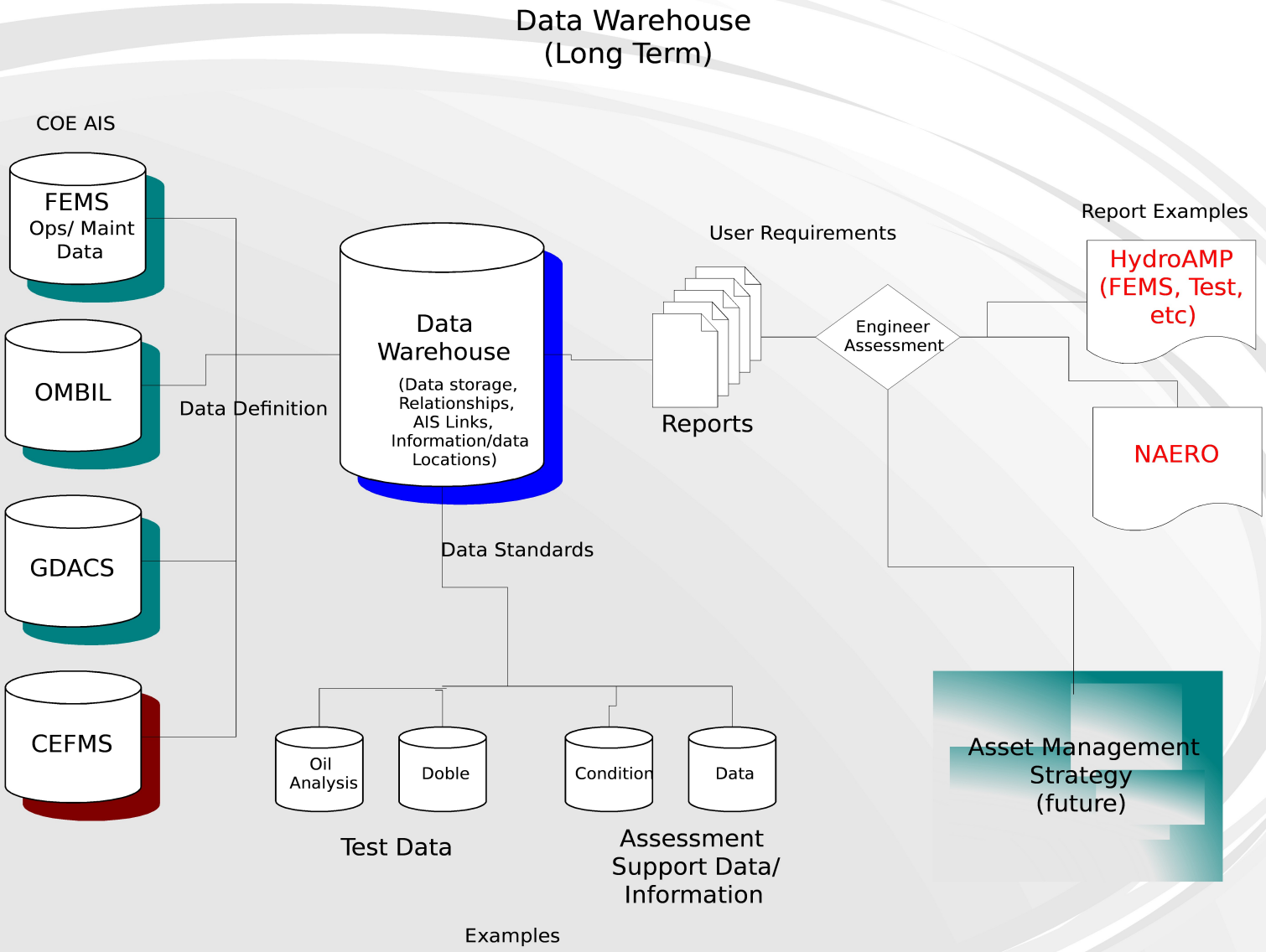
- Hydropower Assets
- Building Assets
- Navigation Assets
- FDR Assets
- Recreation Assets
- Environmental Stewardship Assets
- Water Supply Assets

An Example


FEM
Asset Description, Standards, Activities with costs and Work Management
DATA WAREHOUSE
Repository for Mass Data and its Manipulation-with defined interface paths to/from all AIS/SCADA players
HydroAMP
Hydropower Asset Condition Assessment Tool


Data Warehouse
(Long Term)
COE AIS
FEMS
Ops/ Maint
Data
OMBIL
GDACS
CEFMS
Data Definition
Data
Warehouse
(Data storage,
Relationships,
AIS Links,
Information/data
Locations)
Data Standards
User Requirements
Reports
Engineer
Assessment
Report Examples
HydroAMP
(FEMS, Test,
etc)
NAERO
Asset Management
Strategy
(future)
Oil
Analysis
Doble
Condition
Data
Test Data
Assessment
Support Data/
Information
Examples

Questions?